Small business (top) and MHP plant (below) in rural Afghanistan
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UPDATE REPORT

Q4 / 2020

ABSTRACT
This report summarises all activities of the "International Support for Village Renewable Energy Survey for Afghanistan" assignment for the period from 01.10.-31.12.2020.

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Quarterly Update Report – Q4 / 2020

"International Support for Village Renewable Energy Survey for Afghanistan"

Duration of assignment	October 2020 – November 2021
Period covered in this report	October 2020 – December 2020
Date of report submission	18. December 2020

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[1] This report is submitted to GIZ by the team of International Consultants

Introduction

In this assignment, two companies work together to jointly provide support to a survey on potential applicability of renewable energy (RE) technologies in rural Afghanistan. While intec will take over the solar component, Skat Consulting AG will cover the Micro Hydropower (MHP) section and provides an expert for overall project coordination.

The common objective of the International Consultants is to have international specialists in a wider RE Survey Team acting as external data evaluators, quality assurers and technical solution advisers on data collected from the RE Survey conducted in the Afghanistan Provinces of Badakhshan, Takhar and Bamyan. Thus, the two contracts will jointly support National Consultants who facilitate the study locally.

The survey will be facilitated by a district-based interval survey approach. "Interval survey" implies that field surveying is regularly interrupted in order to allow for data entry, data review, adjustments to survey methodology and scheduling. It is anticipated that 2-4 district-based field surveys are conducted over a period of 1 month, with a 1-month post-survey interval, further 1-month field surveys, followed by another 1-month interval, and so forth. During this post-survey interval, the International Consultants will…

- support the data collection procedure and district-based rural electrification interval survey, conducted by the national consultants
- evaluate the RE Survey data and extract relevant information for determining technical specifications,
- provide feedback to the National Consultants on data quality and
- make adjustments to the GIZ RE Survey Tool if required
- develop 42 district fact sheets

The overarching objective of the solar component is to provide a reliable supply of electricity from solar PV systems to Small and Medium Enterprises. We also aim at introducing new technical and economic approaches for operating their renewable energy installations as well as the used equipment. The main tasks of the solar expert will be:

- Propose business energy solutions, including technical specifications and maintenance protocols of the proposed systems
- Evaluation of tenders received in the procurement of the proposed specifications

The focus of the MHP component is on existing MHP installations with analysing the repair, refurbishment and/or upgrading potential. For each MHP site a specific fact sheet, including recommendations will be compiled describing briefly the current condition supplemented with photographic evidence and possible future works, considering the cost effectiveness of the proposed MHP solution comparing to other RE solutions. The fact sheets will comprise about three pages as well as a supplementary photograph folder and will serve as a guide to subsequent technical site inspections.

This report aims at summarising the activities, their status quo, as well as challenges in the process. It further shows recommendations where possible. This is the first out of four quarterly reports and covers the period from 1st of October until 31st of December 2020. The International Consultants will provide a final report at the end of the assignment (30.11.2021) including major findings from all four quarterly reports.

Selection of most relevant activities

Onboarding Workshop in Bonn

After the two tender processes (solar and MHP experts) have been concluded, GIZ and the International Consultants have kicked-off the assignment through two separate kick-off calls (GIZ and intec as well as GIZ with Skat Consulting AG). After this first conversation, GIZ invited both parties to a presence "onboarding workshop" at GIZ Campus Bonn.

After a round of introduction including colleagues from GIZ Afghanistan, the roles were defined and clarified. Afterwards, Robert Schultz gave an introduction on the Energy Sector Improvement Programme (ESIP) and Fahim Fazil, who joined virtually, presented the RE Survey approach. In addition, the team discussed and agreed on the implementation plan which had been aligned by Wesley Wojtas in advance of this meeting. Furthermore, the RE Survey Tool was briefly described and a discussion was opened.

Tasks from the onboarding workshop included the following points:

- Review RE Survey Tool to check if additional questions / data is needed
- Prepare for the Kick-Off-Workshop with National Consultants

First Review of the RE Survey Tool

The RE survey tool has been reviewed by all three International Consultants. We see that it covers almost all the aspects and data that serve as an input to our assignment.

However, the solar expert has additionally suggested further questions that ensure the availability of relevant information concerning the local infrastructure, interfaces and resources. The tool has accordingly included:

- Assurance of the site legal and technical access
- Validation of the magnitude of the solar irradiation and further meteorological conditions;
- Building load bearing capacity
- Building coordinates
- Potential shading
- Grid voltage level connected

In addition, the MHP expert has provided a document including a long list of suggestions to be included into the survey tool and questions to be clarified for a better understanding of the tool. Recommendations were provided on village-, institutions-, business- and household sheets of the tool. The recommendations on the MHP sheet mainly referred to:

- The sequence of questions (which was partly adapted)
- Questions to check consistency of information
- Question related to proper management of the MHP system
- Comprehensibility of the questions / improvement of the formulations
- Formatting, typos, doubling/bundling of questions

Kick-Off Workshop with full RE Survey Team including the National Consultants

The international project coordinator was involved in the organisation and facilitation of the online kick-off workshop:

- Preparing the agenda
- Preparing interactive live-surveys on mentimeter
- Preparing Mural Board for an online introduction round
- Acting as a co-moderator during the international agenda sessions

Based on the MHP training which had been provided by Zubair Ahmad Ahmadi, the international MHP expert prepared and presented more specific contents relevant for the MHP assessment. The presentation on day one of the workshop (29.11.20) included:

- expected result of the survey,
- what is needed for MHP fact sheets,
- explanations on how to assess potential for MHP system upgrade (head measurement and flow measurement),
- elements in the RE survey tool,
- possible problems to look at,
- "rules of thumb" for rough logical checks

As a follow-up on the workshop, the MHP expert supported the National Consultants in procuring equipment (e.g. clinometer). Furthermore, she gave an additional training session (5.12.2020) on open questions from the kick-off workshop explaining MHP in more detail. For the one hour session, the presentation from 29.11.20 was reviewed and complemented by more pictures and explanations in particular on different types of MHP systems, the terminology, more detailed explanations on head measurement with clinometer and flow measurement with bottle method, "real situations" in the field and how to handle them, additional photos to provide more examples for a better understanding.

On the second day of the kick-off workshop, the solar expert further discussed the procedures of the activities under the solar component. This has compromised the following inputs from the RE tool:

- Building coordinates
- Available areas
- Demand estimates
- Photos to confirm the suitability with respect to shading, availability of adequate roof space, absence of carcinogenic material, interference with environmental or social conditions in the surrounding:
  - Panoramic photo from the rooftop
  - Photo of the South horizon
  - Photos of neighbourhood buildings and surroundings

Activities and deliverables – an overview of the status quo

Table 1: Overview of activities and deliverables / source of verification.

#	Activity	From - To	Status[2]	Source of Verification
A	**Synchronisation between GIZ, International and National Consultants**			
A.1	Kick-Off in Bonn	02.10.20		GIZ presence during the kick-off
A.2	Online Kick-Off Workshop[3]	29./30.11.20		GIZ presence during the kick-off
A.3	Continuous support of National Consultants;	Oct. 20 – Nov. 21		• International team meetings; • Bi-weekly operational meetings; • Distant coaching sessions
A.4	Close cooperation with GIZ offices in Germany and Afghanistan.	Oct. 20 – Nov. 21		Bi-weekly managerial meetings
A.5	Exchange between international experts	Oct. 20 – Nov. 21		Synchronised output (e.g. this mutually developed report)
B	**RE Survey**			
B.1	Review of RE Survey tool	Oct. 20 – Nov. 21		Continuous inputs delivered to GIZ staff
B.2	42 district fact sheets	Oct. 20 – Nov. 21		Finalised fact sheets
B.3	Up to 800 MHP fact sheets	Oct. 20 – Nov. 21		Finalised fact sheets
B.4.1	Suggestions for business energy solutions	Jan. 21 – March 21		Sheet of recommendations
B.4.2	15 x business solar energy solutions specifications	April 21 – Aug. 21		Sheet of Specifications
B.4.3	First batch of business solar solutions	End of March 21		Sheet with business solar solutions
B.4.4	15 x maintenance protocols	June 21 – Oct. 21		Protocols
B.4.5	6 x Tender evaluation	May 21 – Nov. 21		Evaluation forms
C	**Reporting**			
C.1	Q4 / 2020	01.10.-31.12.2020		Submitted to GIZ staff on 18.12.2020
C.2	Q1 / 2021	01.01.-31.03.2021		To be submitted to GIZ staff on 26.03.2021
C.3	Q2 / 2021	01.04.-30.06.2021		To be submitted to GIZ staff on 25.06.2021
C.4	Q3 / 2021	01.07.-30.09.2021		To be submitted to GIZ staff on 24.09.2021
C.5	Final Report	01.10.-30.11.2021		To be submitted to GIZ staff on 24.11.2021

[2] Completed = Green / Not yet started = Blue / Ongoing = Yellow / Failed = Red

[3] Between GIZ Germany, GIZ Afghanistan, International and National Consultants

Next steps

In this section, the next steps are illustrated in particular for the next quarter; Q1 / 2021 (01.01.-31.03.2021). Furthermore, an overall plan for the rest of the assignment is presented (see table 2).

The following paragraphs show the immediate common next steps for Q1:

All three experts will focus on the first batch of data and its evaluation. The experts will provide feedback to GIZ and the National Consultant on the quality of the data in the bi-weekly managerial as well as during the bi-weekly operational calls. This period will also include the development of a draft version of district fact sheets. An international meeting is scheduled for end of January, however, the situation related to COVID-19 makes traveling currently impossible. It has to be seen, whether this will change again in the coming weeks. Nevertheless, the International Consultants are ready to meet in Dubai for an in-person exchange whenever possible. Further activities are divided into the two components as follows:

The solar expert will focus on promising SMEs that would enable the use of solar PV resources. The selection criteria will include (non-exhaustive):

- Size of the enterprise/workshop (potential for economies of scale);
- Electricity prices;
- Solar friendly demand profiles;
- Available areas for the PV system;
- Low market risks of the enterprise and stable demand of produced products (off-taker risk);
- Ecological awareness;
- Potential access to subsidies.

As a next step, the solar expert will evaluate these inputs and initiate the system sizing and design. He will utilise the use of energy systems modelling software PVsyst, to determine the preferred size of system components and operation based on techno-economic rationales. Optimised systems settings will be designed: optimal orientation of the solar module lines, module type, different module/inverter combinations, as well as predictions for such different configurations for different solar systems capacities. The outcomes will include:

- Conceptual design of the system;
- Cost-benefit analysis;
- Energy Yield;
- Cost estimates;
- LCOE calculation.

The MHP expert focuses on the development of the MHP fact sheets. The first round will probably provide the data for up to 20 different MHP sites which means also up to 20 fact sheets. Based on the quality of data from the first field trip, the structure for the MHP fact sheet will be drafted and a first set of fact sheets will be developed jointly with the National Consultants. The fact sheet is limited to a first order assessment, indicative of the current condition, and not an in-depth assessment.

After the review of the first set of data, this iterative process continuous. Q1 ends on 31st of March together with the next quarterly update report. The whole process in 2021 is illustrated in table 2 below:

Table 2: Implementation plan 2021

	2021											
	1	2	3	4	5	6	7	8	9	10	11	12
Aligned activities												
Meetings & calls												
Bi-weekly calls on managerial level	x	x	x	x	x	x	x	x	x	x	x	
Bi-weekly calls on operational level	x	x	x	x	x	x	x	x	x	x	x	
International team meetings												
RE survey tool evaluation: revision and improvement												
Reporting			20.			19.			18.		20.	
Tasks of national consultants												
Training of local staff												
Preparation and submission of spatial data						19.					20.	
Survey / data collection	6./7.											
Submission of appliance catalogue / photographs			20.			19.			18.		20.	
Tasks of internataional consultants												
Remote support for national consultants												
Exchange between international experts												
Data review & development of 42 district fact sheets												
Up to 800 MHP Fact Sheets incl. photograph folders												
Proposing business energy solutions												
15 x business solar energy solutions specifications												
First batch of business solar solution												
Elaboration of maintenance protocols												
15 x maintenance protocols												
Tender launch by GIZ												
Tender evaluation												
6 x bundled / lot-based Tender evaluation												

Recommendations

This early in the process, there are only few recommendations as follows:

- The whole survey team should spend enough time on…
  - exchanging with surveyors on possible difficulties and experiences beyond just filling in the questionnaires, and…
  - explaining the details of PV, but especially of MHP aspects to surveyors to increase their knowledge and understanding on the topic. A sound capacity building is important to strengthen local know-how for possible next steps even beyond the survey as such.
- GIZ might want to ask the National Consultants for their periodical update report two weeks before the end of each quarter. This allows the International Consultants to include findings from the National Consultants' report into this reporting scheme in order to provide GIZ a holistic report including all activities from National as well as International Consultants.

Annexes

00_RE Survey Team (screenshot from Mural Board)

01_List of suggestions and questions for the RE survey tool by the MHP expert

02_Kick-Off-Workshop Agenda

03_MHP presentation_Hedi Feibel

04_Solar presentation_Tareq Zahw

05_Kick-Off-Workshop mentimeter survey day 1 and results

06_ Kick-Off-Workshop mentimeter survey day 2 and results

➔ All documents can also be found in the MS Teams room “AFG ESIP Rural Electrification with guests” in the channel “General” under “Files” in several folders.